1874MNRAS..35...13J

Remarks on Ancient Chinese Eclipses. By the Rev. Samuel J. Johnson.

Some years ago, two lists of solar eclipses, said to have been observed in China, were presented to the Society by Mr. Williams, one dating from B.C. 720 to B.C. 495, the second reaching from B.C. 481 to B.C. 1. The writer states: "In conclusion, I have to remark, that I have merely given the data for these eclipses as they occur in the *Chun Tsew*, leaving it to those who are accustomed to this kind of work, and who may feel an interest in it, to ascertain the correctness of the recorded observations, and thus to test the general accuracy of early Chinese history." Not being aware whether any investigation of these eclipses has been entered into, I have examined some of them by the expeditious tables given in the *Encyclopædia Britannica*, 8th edition. The said tables give satisfactory results for the Nineveh eclipse, B.C. 763, and various other ancient ones. They will, at any rate, indicate instances where exact calculations may be resorted to, if desired, without expending time on such as turn out to be of no importance. It is suggested the observations of these Chinese eclipses might be made in the State of Loo, between the great rivers Yang Tze Keang and Hwang Ho, between 32°–34° north latitude, and 115°–120° east longitude. I therefore computed for a point in longitude 118°, and latitude 33°, being about the centre of the supposed district. Seven eclipses on Mr. Williams's list are termed total, those of B.C. 709, 601, 443, 382, 301, 188, 181. None of them turn out total at this spot, though some are of considerable magnitude; but one circumstance deserves notice, that in every instance the greatest phase seems to have occurred north of this place.

Mr. Williams speaks of the eclipses of 552 and 549, Nos. 22 and 25 of the first list, having happened the month after the eclipse immediately preceding them. The explanation is easily given. The eclipses of 552, August 20, and 549, June 19, actually took place; the two succeeding ones did not occur. It seems both eclipses of B.C. 204, and both of B.C. 177, should be also erased. One would wish the Chinese accounts had particularised more, instead of giving a bare notice of the event.

Ec. of 720, July 17. This, an eclipse in the autumn of this year, in the seventh moon, seems to have attained a magnitude of two-thirds on the Sun's upper limb, about 2^h 55^m P.M. in longitude 118° E., and latitude 33° N.

Ec. of 601, September 20. Given as the Ec. of Thales, by Prideaux. A little calculation would show this was quite inadmissible. Here, in China, it would be seen as a total phenomenon a few minutes before 3^h, and at the place referred to, nine-tenths would be obscured.

Ec. of 443, October 13. "Total, stars seen" according to the *Tung Keen Kang Muh*, but according to my reckoning, of only half the Sun's diameter, on the morning of October 24.

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Ec. of 444, there seems to have been a much larger eclipse.

Ec. of 382, July 3. While the tables do not indicate totality about this spot, they show a very large eclipse about seven in the morning. Also described as "Total, stars seen."

Ec. of 301, August 6. An eclipse on the Sun's north limb on the afternoon of this day, but the magnitude proves small.

Ec. of 188, July 17. Mentioned as total in China in the *Tung Keen Kang Muh*, and referred to also in Tycho Brahe's *Historia Celestis*, as having been seen at Rome, in these words: "Solis eclipsis anno Urbis c. 565, C. Livio Salviatore et Marco Valerio Messalo Coss. ⨀ inter tertiam et quartam diei horam Romæ defecit. Ex Livio, lib. 8, dec. 3."

Nearly total in latitude 33° N., longitude 118° E. Totality, according to these tables, passed a little north of this point, but owing to the small excess of the Moon's semidiameter over that of the Sun, the duration would be short. At Rome, the magnitude would also be very great, and nearly total, between 5^h and 6^h in the morning.

Ec. of 181, March 4. The Sun would be a crescent about $2\frac{1}{4}^h$ afternoon; being 11 digits eclipsed. Totality, a little to the north.

Upton Helions Rectory, Crediton.
1874, *November* 4.

On Certain Phenomena seen during Eclipses of the Sun, and their bearing on the question of a Lunar Atmosphere.

By John Brett.

The eclipse of the Sun of the 10th of October last was observed in the Island of Guernsey under tolerably favourable circumstances. The wind was from the south-west, and the view only occasionally interrupted by clouds. Definition remarkably steady.

At 10^h 15^m G. M. T. the limb of the Moon, towards the following cusp, presented a series of prominent mountains, amongst which was one particularly deep indentation or notch.

The phenomenon to which this paper refers occurred at the time this particular notch arrived at the cusp and passed off the Sun's disk.

It consisted of a minute ray or brush of light, proceeding from the cusp of the Sun, and intruding upon the Moon's limb; the appearance in this instance being exceedingly transient, and disappearing within two seconds of time.

The rapidity of the intrusion was equal to that of the Moon's motion, so that it may be more correctly described as light dragged away from the Sun's cusp than light projected upon the Moon's disk.

The cusp was, of course, blunted by the notch or lunar valley, and it was at this moment that the encroaching light advanced over the limb.

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